DOCUMENT RESUME

ED 171 526 **SE 027 563**

TITLE	Suggestions for Teaching Mathematics Using Laboratory Approaches in Grades 1-3. 7. The Metric System.
INSTITUTION	New York State Education Dept., Albany. Bureau of General Education Curriculum Development.; State Univ. of New York, Albany.
SPONS AGENCY	Bureau of Elementary and Secondary Education (DHEW/OE), Washington, D.C.
PUB DATE	77
NOTE	43p.
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	Activities; Elementary Education; *Elementary School Mathematics; Instructional Materials; *Learning Activities; Learning Difficulties; Mathematics Education; *Mathematics Instruction; Metric System; Primary Education; Primary Grades; *Remedial Instruction; *Remedial Mathematics
IDENTIFIERS	Elementary Secondary Education Act Title I

ABSTRACT

This guide is the severth teachers' guide developed by the Division for Curricular Services and the Bureau of Mathematics Education in cooperation with the Division of Federal Education Opportunity Programs, ESEA Title I. It contains 100 mathematics activities within 37 pages for primary students. The activities are planned for teachers to use with children who have had difficulty with mathematics in traditional programs. Using the mathematics laboratory approach, children can actively engage in measuring, recording, estimating, and weighing in metric units. Each activity includes: (1) a suggested grade level; (2) a statement of purpose; (3) a list of familiar classroom objects and metric devices to use; (4) a set of procedures to follow; and (5) questions to guide the teacher and students through the activities. Sample charts and illustrations are interspersed throughout the manual. (SA)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Joan A. Miller

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

ED171526

SE 027 563

SE

SUGGESTIONS FOR TEACHING MATHEMATICS USING LABORATORY APPROACHES IN GRADES 1-3

7 THE METRIC SYSTEM

HECTO KILO
GRAM DEKA
CENTI MILLI
LITER GRAM
METER

...EAU OF ...LE...
...he ...ersity of the State ...o...
THE ...TE ...EDUCATION DEPARTMENT
...ureau of ...ural ...ucation
Albany, New York 12234
1977

2

THE UNIVERSITY OF THE STATE OF NEW YORK

Regents of The University (with years when terms expire)

1981 Theodore M. Black, A.B., Litt.D., LL.D., Pd.D., D.C.L., L.H.D., Chancellor - - - - - - - - - - - - - - - - - - - Sands Point
1987 Carl H. Pforzheimer, Jr., A.B., M.B.A., D.C.S., H.H.D., Vice Chancellor- Purchase
1978 Alexander J. Allan, Jr., LL.D., Litt.D. - - - - - - - - - Troy
1986 Kenneth B. Clark, A.B., M.S., Ph.D., LL.D., L.H.D., D.Sc.- Hastings on Hudson
1983 Harold E. Newcomb, B.A. - - - - - - - - - - - - - - - - - Owego
1988 Willard A. Genrich, LL.B., L.H.D., LL.D.- - - - - - - - - Buffalo
1982 Emlyn I. Griffith, A.B., J.D. - - - - - - - - - - - - - - Rome
1983 Mary Alice Kendall, B.S.- - - - - - - - - - - - - - - - - Irondequoit
1984 Jorge L. Batista, B.A., J.D., LL.D. - - - - - - - - - - - Bronx
1982 Louis E. Yavner, LL.B.- - - - - - - - - - - - - - - - - - New York
1979 Laura B. Chodos, B.A., M.A. - - - - - - - - - - - - - - - Clifton Park
1980 Martin C. Barell, B.A., I.A., LL.B. - - - - - - - - - - - Kings Point
1981 Joseph R. Bongiorno, B.S., M.D. - - - - - - - - - - - - - Brooklyn
1984 Louise P. Matteoni, B.A., M.A., Ph.D. - - - - - - - - - - Bayside
1981 J. Edward Meyer, B.A., LL.B.- - - - - - - - - - - - - - - Chappaqua

President of The University and Commissioner of Education
Gordon M. Ambach

Executive Deputy Commissioner of Education

Acting Deputy Commissioner for Elementary, Secondary and Continuing Education
John W. Polley

Associate Commissioner for Instructional Services
Vivienne Anderson

Assistant Commissioner for General Education and Curricular Services
Maria Ramirez

Coordinator of the Office of ESC Education Opportunity Programs and Office of Urban School Services
Sterling Keyes

Director, Division of Federal Education Opportunity Programs
John L. House

Chief, Bureau of Federal Education Opportunity Programs (Upstate)
William C. Flannigan

Director, Division of General Education
Ted T. Grenda

Chief, Bureau of Mathematics Education
Fredric Paul

Director, Division for Curriculum Services
Gordon E. Van Hooft

Chief, Bureau of General Education Curriculum Development
Herbert Bothamley

PREFACE

Substantial financial aid to local educational agencies for children of low income families was provided by the Elementary and Secondary Education Act of 1965. Participating school districts have developed a variety of new educational programs to assist children with special educational needs. These programs are based upon local needs assessment with major parental involvement.

The three major priorities for compensatory education programs are bilingual education, reading, and mathematics. One of the highest priority programs under ESEA Title I is the subject matter area of mathematics. Experience has shown that children who have experienced difficulty learning in a traditional program often react with enthusiasm to a mathematics laboratory approach. This publication was developed to provide practical applications of this mathematics approach for use by classroom teachers. It should provide practical suggestions for teachers working directly with children with special educational needs who have not been reached by more conventional methods of instruction.

FOREWORD

The Division for Curricular Services and the Bureau of Mathematics Education in cooperation with the Division of Federal Education Opportunity Programs, ESEA Title I, have developed a variety of materials on the use of a Mathematics Laboratory approach. This joint effort has resulted in the release of the following publications:

Operating A Math Lab, presents a short overview of the Math Lab method.

ESEA I, Anatomy of an Elementary Project, gives a concrete example of the use of a Mathematics Laboratory approach with children having identified weaknesses in the mathematics area of problem solving.

Suggestions for Teaching Mathematics Using Laboratory Approaches Grades 1-6

1. Number and Numeration
2. Operations
3. Geometry
4. Measurement

Suggestions for Teaching Mathematics Using Laboratory Approaches Grades 5-8

5. Number and Numeration, Operations, Geometry, Measurement
6. Probability

These publications provide practical suggestions for teachers who wish to work with their students within the perspective of a laboratory approach.

Encouraged by the response of teachers and administrators of these publications, a decision was made to move even further in the direction of providing concrete activities for teachers who wish to continue moving into the humanistic approach inherent in a Mathematics Laboratory program. Fredric Paul, Chief, Bureau of Mathematics Education and Peter A. Martin of the Bureau of General Education Curriculum Development began the task of developing more materials for teacher use. A writing team of Helen Feder and Bernice Bittner of the Plainedge School district prepared a series of metric activities for use in the primary grades. The material was field tested in a number of classroom situations. As a result of favorable reactions additional activities have been produced for use by classroom teachers.

This publication is the seventh which has been developed for teacher use. Each incorporates the latest thinking of the mathematics revision committee and may be utilized with any basic mathematics program. It is designed to serve as a stimulant to encourage teachers to employ their imaginations to develop further activities. The classroom teacher in developing a set of "task cards" will adjust vocabulary and choose concrete materials in terms of an intimate knowledge of the ability levels of the children involved and the type and amount of manipulative materials available. Suggestions are welcome and should be sent to Fredric Paul, Chief, Bureau of Mathematics Education, State Education Department, Albany, New York 12234.

Peter A. Martin of the Bureau of General Education Curriculum Development did the final editing, contributed material and illustrations, and prepared the materials for publication.

METRIC ACTIVITIES - GRADES 1-3

7-1 A Long Line. Purpose: Counting, linear measurement, recording differences, comparisons

Suggested grade level: 2, 3

Materials needed: Paper cut into 10 cm squares

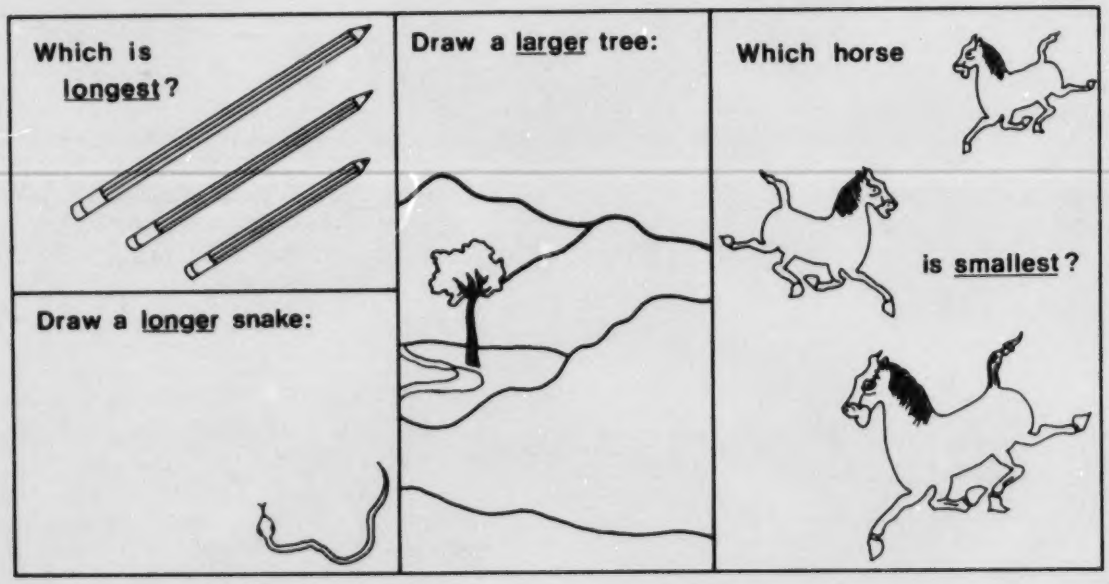
Procedure: Choose a friend with whom you would like to work. Guess how many squares you would need to make one long row from the back to the front of your classroom. Record your guess in your notebook. Lay the paper squares on the floor end to end. Count the number of squares you used. Record your answer in your notebook. Was your guess greater than the amount of squares actually used? How much greater? Was your guess smaller than the amount used? How much smaller?

7-2 The Long and Short of It. Purpose: Comparison, estimation, linear measurement

Suggested grade level: 1

Materials needed: Set of simple illustrations as given below

Procedure: Look at the pictures. Record your answers in your notebook in response to instructions from your teacher.

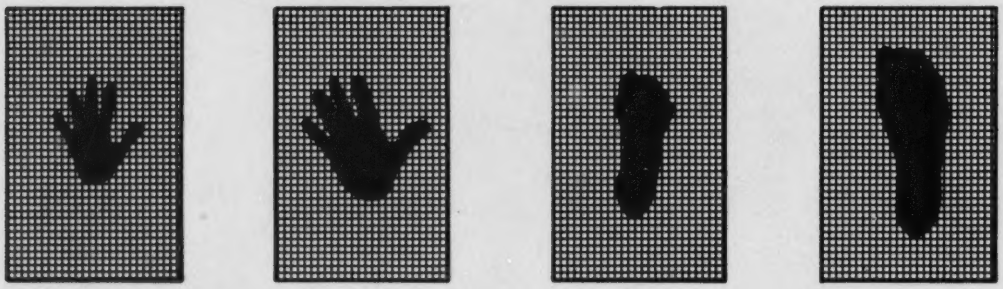


7-3 Hands and Feet. Purpose: linear measurement, counting, vocabulary, recording, estimation, area, comparison, subtraction

Suggested grade level: 1, 2

Materials needed: Pencils, metric grid paper

Procedure: Choose a partner with whom you would like to work. Look at the grid paper and guess how many squares your hand will cover. Record this guess in your notebook. Place your hand on the grid paper and ask your partner to trace around it. Count the number of squares your hand covered and record this answer in your notebook. Was your guess larger than your answer? How much larger? Was your guess smaller than your answer? How much smaller? Now repeat this experiment using your foot.



7-4 Button, Button. Purpose: linear measurement, comparison, estimation, recording

Suggested grade level: 1, 2

Materials needed: Ten centimeter measure, box of buttons of uniform size

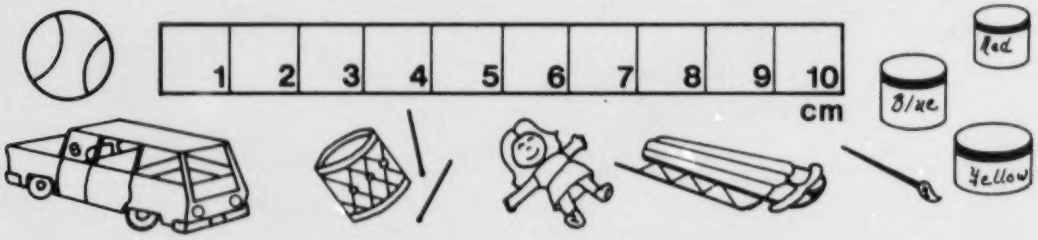
Procedure: Guess how many buttons you need to cover the ten centimeter measure. Record your guess in your notebook. Now lay the buttons down on top of the ten centimeter measure. Count the number of buttons you used. Record this answer in your notebook. Was your answer more than the number of buttons you needed? How much more? Was your answer less than the number of buttons you used? How much less? This activity can be repeated with uniform size buttons, either larger or smaller than those used originally.

7-5 Treasure Hunt. Purpose: Comparison, recording, estimation, linear measurement, vocabulary

Suggested grade level: 1, 2, 3

Materials needed: 10 cm measure, assorted junk

Procedure: Work with a partner. Look around your classroom and try to find five things that are longer than 10 cm. Draw a picture of each object and put the pictures in a pile. Now, look around again to find five things that are shorter than 10 cm. Draw a picture of each object and put these pictures in a different pile. Now, measure the five things you thought were longer than 10 cm. Record each of these measurements in your notebook. Were you correct in each of your estimates? Follow the same procedure with the objects you thought were shorter than 10 cm. Try measuring other objects around your home.

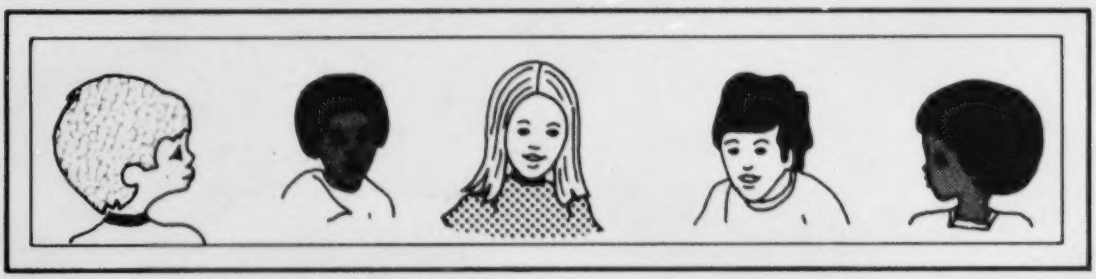


7-6 Graph a Class. Purpose: Linear measurement, comparison, graphing

Suggested grade level: 1, 2

Materials needed: Paper, scissors, pencils, paste

Procedure: Divide the class into small groups. Direct each child to work with a partner. Have each child lie down on a piece of paper, and have each partner trace around the person's body. Have the child's name printed in large letters on the paper outline. Ask the children to cut out their own outlines. Now, have them compare their outlines and attempt to find the smallest outline in the class. Paste this outline to a large sheet of paper. By comparing and measuring, the children should be able to place the remaining outlines in size order. Paste the outlines to paper in size order and display as a graph for children to see and use.



7-7 I'm a Square. Purpose: Estimation, comparison recording, linear measurement, subtraction, vocabulary, geometry

Suggested grade level: 2, 3

Materials needed: Paper cut into 10 cm squares, tape, long sheets of paper, pencils

Procedure: Choose a partner with whom to work. Look at the squares. Guess how many squares it would take to reach from your head to your toes. Record your guess in your notebook. Now lie down on the large paper and have your partner trace your outline. Next, use the squares to make a line from your head to your toes on your outline. Count the number of squares you used. Record the answer in your notebook. Was your guess larger than the number of squares needed? How much larger? Was your guess smaller than the number of squares needed? How much smaller? Now trade places with your partner and repeat this activity.

7-8 Pick a Clip. Purpose: Linear measurement, estimation, comparison, subtraction

Suggested grade level: 3

Materials needed: Standard size paper clips, one decimeter measure marked off in centimeters

Procedure: Hold the paper clips as shown.

Guess how many you will need to fit between the centimeter marking on your measure. Record your guess in your notebook. Place one between the centimeter marking. How many did you need? Record the answer in your notebook. Was your guess larger than the number you used? How much larger? Was your guess smaller than the number you used? How much smaller? Repeat this experiment until you have filled the decimeter strip.

7-9 Where's the Exit? Purpose: Estimation, linear measurement, recording, comparison, subtraction, geometry

Suggested grade level: 2, 3

Materials needed: Paper cut into 10 cm squares

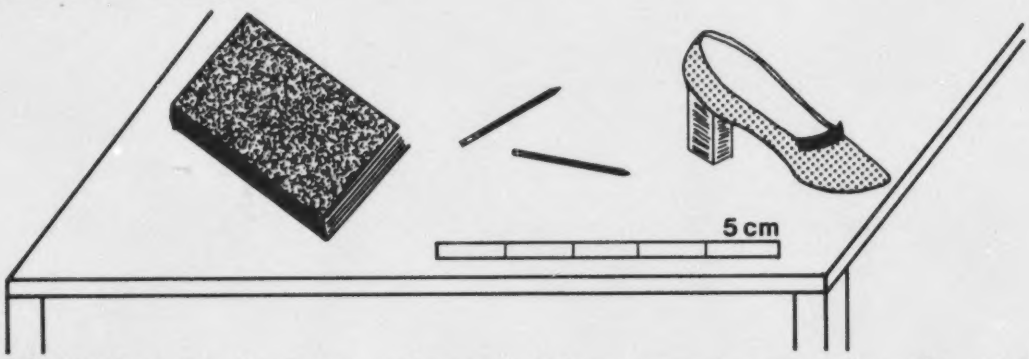
Procedure: Guess how many paper squares you would need to make a path from your desk to the doorway. Record this guess in your notebook. Was your guess greater than the amount you used? How much greater? Was your guess less than the amount used? How much less? You may wish to repeat this activity using other paths between specific objects.

7-10 Measure with Pleasure. Purpose: Estimation, comparison, recording measurement

Suggested grade level: 2, 3

Materials needed: Centimeter ruler

Procedure: To provide an interesting measuring game to be played with other students, the following activity is suggested. A player chooses something in the room that can be measured with a ruler. It might be a book, a shoe, a table, or any other concrete object. The player asks the other players to make a guess about its size in terms of length, width, or height. The size must be in centimeters. Each player records a guess. The object is then measured using a centimeter rule. The player whose guess is closest to the real size gets 10 points. The next player chooses something else to guess about and measure. Keep taking turns. The first player to get 50 points wins the game.



7-11 Handprints on the Paper. Purpose: Linear measurement, directionality, comparison, graphing

Suggested grade level: 2, 3

Materials needed: Brown paper, pencils, paste

Procedure: Choose five classmates with whom to work. Look at your right hand. Compare your right hand with the right hands of your friends. Guess who has the largest hand. Record your guess in your notebook. Guess who has the smallest hand. Record your guess in your notebook. Have a friend trace around your hand. Write your name on the handprint, and cut it out. Help the other student partners do the same with their handprints. Compare the handprints, and place them in order of size from the smallest to the largest. Paste the handprints on brown paper in size order. Show your teacher your handprint graph.

7-12 Around and Around. Purpose: Linear measurement, comparison, estimation, recording

Suggested grade level: 1, 2

Materials needed: String, 50 centimeter measure

Procedure: Ask a classmate to help you fill in the chart below. Cut a piece of string the same length as your 50 centimeter measure. Ask your friend to use the string to help you find the answers.

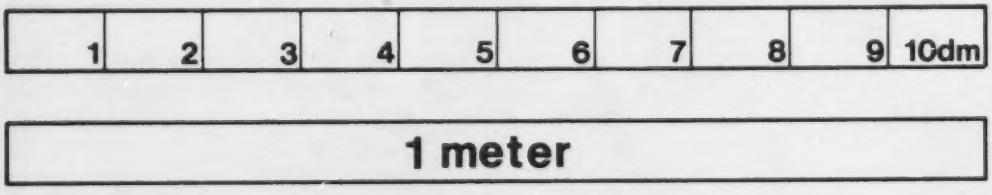
Measured Part	Is it more than 50 or less than 50 cm?	Actual Measurement
Around my head		
Around my wrist		
Around my neck		
Around my waist		
Around my ankle		
Around my elbow		
Around my knee		

7-13 I've Got You Covered. Purpose: Estimation, comparison, recording, linear measurement

Suggested grade level: 2, 3

Materials needed: One meter measure, 10 decimeter measures

Procedure: Guess how many decimeter measures you would need to equal the length of one meter measure. Record your guess in your notebook. Now, place the meter measure straight out on the floor. Carefully lay the decimeter measures on top of the meter measure. How many decimeter measures did you need to cover the meter measure? Record your answer in your notebook. Did you guess right?

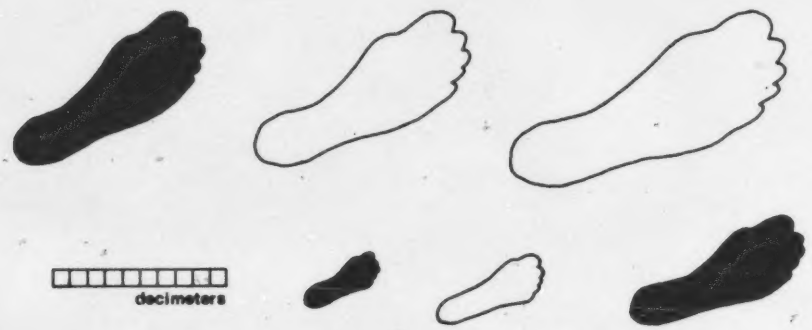


7-14 Big Foot, Little Foot. Purpose: Estimation, comparison, directionality, vocabulary, linear measurement, graphing, division

Suggested grade level: 3

Materials needed: Decimeter measure, paper of different colors, pencils, scissors, glue

Procedure: Choose some classmates with whom you would like to work. All remove right shoes. Look at all of the right feet. Look at the decimeter measure. Guess whose right foot is longer than two decimeters. Record your guess in your notebook. Guess whose foot is smaller than two decimeters. Record your guess in your notebook. Trace the outline of your right foot. Write your name on it. Cut it out. Measure your footprint using your decimeter measure. Record your answer on your footprint. Take a large sheet of paper of a different color and fold it in half lengthwise. At the top of one half, write greater than two decimeters. Work with your friends, and glue the footprints to the proper half of the paper. Find some space in your room to hang up your picture.



7-15 Ribbon Roulette. Purpose: Measurement, estimation, comparison, directionality, recording

Suggested grade level: 2, 3

Materials needed: Ten centimeter measure marked at each centimeter, box of ribbons of assorted widths and colors

Procedure: Look carefully at your centimeter measure and then close your eyes. Can you picture 2 centimeters? Open your eyes. Choose a ribbon from the box. Guess whether the ribbon is less than 2 centimeters wide. Record your guess. If you guess it is less than 2 cm wide, place it to your right on the floor. If you guess it is greater than 2 cm wide, place it to your left on the floor. If you guess it is exactly 2 cm wide, place it in front of you on the floor. Choose at least nine more ribbons and repeat the experiment. Now measure each ribbon against your centimeter measure. Record your answers in your notebook. Compare the answers with your guesses. Did you place the ribbons in the correct pile?

7-16 People Puzzle. Purpose: Estimation, comparison, linear measurement, subtraction

Suggested grade level: 2, 3

Materials needed: Meter measure

Procedure: Choose someone with whom you would like to work. Guess who is taller, your mother or your teacher. Record your guess in your notebook. Measure your mother's height. Measure your teacher's height. Record the measurements in your notebook. Who was taller? How much taller? Did you guess right?

7-17 You're Covered. Purpose: Estimation, comparison, linear measurement, recording, area, counting, geometry

Suggested grade level: 2, 3

Materials needed: Papers cut into 5 cm squares

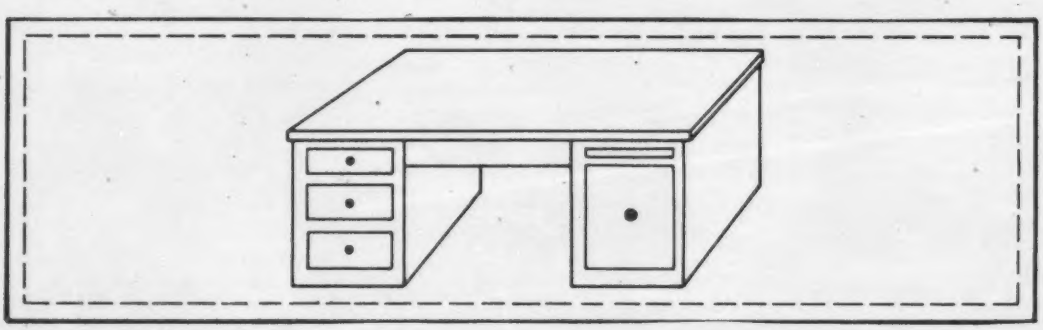
Procedure: Guess how many squares of paper you would need to cover your desk. Record your guess in your notebook. Use the paper squares to cover your desk. Count how many paper squares you used. Record this answer in your notebook. Was your guess greater than the amount of paper squares you used? How much greater? Was your guess smaller than the amount of paper squares you used? How much smaller? Repeat this activity with your chair.

7-18 From Border to Border. Purpose: Estimation, comparison, linear measurement, recording, perimeter, counting, geometry

Suggested grade level: 3

Materials needed: Papers cut into 5 cm squares

Procedure: Guess how many squares of paper you will need to cover all around the edges of your desk. Record your guess in your notebook. Use the paper squares to cover the edge of your desk. Count how many squares you used. Record your answer in your notebook. Was your guess greater than the number of paper squares you used? How much greater? Was your guess less than the number of paper squares you used? How much less? Repeat this activity with your chair.



7-19 Lovely Leaves. Purpose: Linear measurement, estimation, comparison, recording

Suggested grade level: 3

Materials needed: One decimeter measure, assorted leaves

Procedure: Ask a classmate to help you collect a pile of leaves of assorted sizes. Take a careful look at your decimeter measure. Try to sort the leaves into two piles. Make one pile of leaves which you think are shorter than your decimeter measure. Make another pile of leaves which you think are longer than your decimeter measure. Measure the leaves from the shorter pile with your decimeter measure. Were they shorter? Measure the leaves from the longer pile with your decimeter measure. Were they longer?

7-20 Peppy Popcorn. Purpose: Linear measurement, recording, estimation, comparison, subtraction

Suggested grade level: 1, 2, 3

Materials needed: One double bedsheet, one hot pad, one corn popper, one meter stick

Procedure: Spread the bedsheet and have the children sit around, but not on, the bedsheet. Place the corn popper on the center of the sheet on a hot pad. Ask the children to guess how far the corn will pop if you do not cover the corn popper. Tell them to record their guesses in their notebook. Pop 30g of corn without the cover. Have the children measure the distance of the kernel furthest from the popper. Record this distance on the board, and have the children record it in their notebooks. Who came closest to the actual distance? How close?

7-21 Two, Four, Six. Purpose: Linear measurement, vocabulary, recording, counting, addition, division, comparison

Suggested grade level: 1, 2, 3

Materials needed: Three beanbags, three shoeboxes, three strips of masking tape of lengths 2 dm, 4 dm, and 6 dm affixed to floor, felt pen, additional masking tape

Procedure: At the end of each tape affix one shoebox upright, with tape. Write the measurement on top of the box, i.e., 2 dm, 4 dm, 6 dm. Ask the children to divide into two teams. Have the children take turns tossing the beanbag into the shoebox. The team finds its total score by recording and adding the numbers on the top of the boxes in which the beanbag lands. The team with the higher score is declared the winner. Which team had the higher score? Which team had the lower score? What was the difference between the scores of the two teams?

7-22 Nifty Nails. Purpose: Linear measurement, estimation, comparison, recording

Suggested grade level: 3

Materials needed: Decimeter measure, 2 boxes of different colors, i.e., red, blue, assorted nails

Procedure: Ask a friend to help you. Take a good look at your decimeter measure, and then put it away. Close your eyes. Can you picture a decimeter? Open your eyes. Look at each nail carefully. Guess whether the nail is longer than your decimeter measure. If you think it is, place it in the blue box. If you think it is shorter than your decimeter measure, place it in the red box. Use your decimeter measure. Measure the nails in the blue box. Record your answers. Were they all longer than your decimeter measure? Measure the nails in the red box. Record your answers. Were they all shorter than your decimeter measure?

7-23 Taller, Smaller. Purpose: Estimation, recording, linear measurement, comparison, numeral recognition, subtraction

Suggested grade level: 3

Materials needed: One metric measure, two meters long, marked off in centimeters and decimeters, affixed to wall

Procedure: Work with a classmate. Guess how tall you are. Record your guess in your notebook. Stand against the meter measure and ask your friend to help you measure your height. Record your height in your notebook. Now do the same for your friend. Who was taller? Who was smaller? How much taller? What is the difference between the guess and the actual measure? About five months later this activity may be repeated. Compare the new information with the previous measurements. Did your height change? How much did it change? Why do you think it changed?

7-24 Beanbag Toss. Purpose: Linear measurement, vocabulary, recording, comparison, addition, subtraction

Suggested grade level: 3

Materials needed: A beanbag, a tape two meters long, marked at each decimeter and affixed to the floor

Procedure: Choose a classmate with whom you would like to work. Stand behind the foul line. Toss the beanbag and record in decimeters (dm) the distance thrown. This is your score for your first throw. Now let your friend toss the beanbag and record the distance. If the beanbag lands beyond the tape, that counts as a turn, and a zero. Take turns until a score of 25 is reached. The person reaching this score wins the game. Who won the first game? What was the difference between the two scores?

7-25 Pitching Power. Purpose: Estimation, recording, comparison, linear measurement, subtraction

Suggested grade level: 2, 3

Materials needed: Meter measure, beanbag, pillow

Procedure: Choose a classmate with whom you would like to work. Guess how far you can throw the beanbag. Record your guess in your notebook. Which do you think you can throw farther, the beanbag or the pillow? Why? Throw your beanbag. Ask your friend to stand exactly where the beanbag landed. Measure the distance from where you were standing to where the beanbag landed. Record the answer in your notebook. Which went farther, the beanbag or the pillow? How much farther? Can you figure out why?

7-26 Very Varied. Purpose: Comparison, estimation, recording, linear measurement

Suggested grade level: 3

Materials needed: Meter measure

Procedure: On the chart below, many different things are listed. Before you measure anything, make a guess as to whether these things are longer than a meter, or shorter than a meter. Fill in the chart.

A METER

Item	Greater Than or Less Than		Answer	Difference
Desk Height				
Chair Height				
Bicycle Height				
Television Set Height				
Window Height				
Giant Step				
Baby Step				
Teacher's Step				
Teacher's Desk Height				
Teacher's Chair Height				

7-27 Arms Around Daddy. Purpose: Estimation, recording, linear measurement, comparison, subtraction

Suggested grade level: 1, 2

Materials needed: Meter measure

Procedure: Choose a friend to work with you. Guess which is larger, your daddy's or your outstretched arms. Record your guess in your notebook. Now with your friend's help, measure the distance between your outstretched arms. Record your answer in your notebook. Which was larger? How much larger? Did you guess right?

7-28 Friends and Favorites. Purpose: Estimation, recording, comparison, linear measurement, subtraction

Suggested grade level: 1

Materials needed: Meter measure, toys

Procedure: Choose a classmate with whom you would like to work. Bring your favorite toy to school. Ask your friend to bring a favorite toy to school. Guess which toy is longer, yours or your friend's. Record your guess in your notebook. Now with your friend's help, measure your toy, and your friend's toy. Record the answer in your notebook. Which toy was longer? How much longer?

7-29 Ribbon Rally. Purpose: Estimation, counting, comparison, linear measurement, recording

Suggested grade level: 1, 2

Materials needed: Meter stick, box of ribbons of varying sizes, shapes, colors, and widths

Procedure: Choose a classmate to help you. Look at your meter stick. Take the ribbon box and see how many ribbons you can find that are exactly the same length as your meter stick. Make a pile of these ribbons. Measure them using the meter stick. Record the measurements of each ribbon in your notebook. How many ribbons did you find that were exactly one meter? How many were shorter than one meter? How many were longer than one meter?

7-30 Walkabout. Purpose: Linear measurement, estimation, comparison, recording, subtraction, vocabulary

Suggested grade level: 1, 2, 3

Materials needed: Metric trundlewheel

Procedure: Guess how many meters it is from your classroom door to the door of the gym. Record your guess in your notebook. Use the trundle wheel to measure the distance. Record your answer in your notebook. Was your guess greater than the distance you measured? How much greater? Was your guess less than the distance you measured? How much less?

7-31 Happy Days. Purpose: Estimation, linear measurement, equalities, recording

Suggested grade level: 1, 2, 3

Materials needed: Metric measuring tape or ruler, string

Procedure: Find a piece of string. Select a metric ruler or measuring tape. Ask a friend to measure your widest smile with the string. Put the string along the metric ruler. How many centimeters does your smile measure? Measure your friend's smile. Who will have the longer smile? Who will have the shorter smile? Who will have the longest smile in your class? Guess! How will you find out? Was your estimate correct? Was your estimate more? Was your estimate less?

7-32 What's New. Purpose: Vocabulary, awareness of metrics in the environment

Suggested grade level: 2, 3

Materials needed: Newspapers, magazines, paste, paper

Procedure: Find newspaper or magazine articles about metric measurement. Can you find labels in the supermarket or at home that mention metrics? Make a book of metric labels, advertising, and news articles. Make a bulletin board of all the things the whole class brings in on metrics for one week. Do you hear metrics mentioned on TV? Make a report about what you have heard about metric measurement.

7-33 Metric Mix Ups. Purpose; Metric vocabulary

Suggested grade level: 2, 3

Materials needed: Scrambled list below on tag board

1.	trimec	kilo
2.	demiterce	meter
3.	retil	centimeter
4.	treem	liter
5.	oilk	gram
6.	creemtenit	millimeter
7.	telerimlin	decimeter
8.	ramg	metric

Procedure: Put the letters in the right order. Find the right word. What does each word mean? As an introduction to the metric system, children need first to become acquainted with the vocabulary. They should be encouraged to relate metric terms to their environment.

7-34 Be a Meter Leader. Purpose: Estimation, counting, metric measurement, recording, comparison

Suggested grade level: 1, 2, 3

Materials needed: Meter stick

Procedure: Find three things in the classroom that are taller than a meter. Record your estimate. Use a meter stick and measure. Record your findings. Compare what you measured with your estimate. Were you correct? Or was it more? Less? Now find three things that are shorter than a meter. How can you really find out if they are really shorter than a meter?

7-35 Measure Hunt. Purpose: Estimation, comparison, recording, metric measurement

Suggested grade level: 1, 2, 3

Materials needed: Straws, pencils, paint brush, crayon, pipe cleaner, match box

Procedure: Work with a classmate. Select a straw. Guess how many centimeters long it is. Write your estimate in your notebook. Compare your estimate to your friend's estimate. Measure the straw to the nearest centimeter. Was your guess more? Less? Or the same? Remember, estimate first then measure. Write your guess and your findings in your notebook and then compare. Select a pencil. Guess how long it is in centimeters. Measure and compare. How close was your estimate? Select other objects and follow the same procedure.

7-36 Weigh In. Purpose: Weighing, comparison, recording, estimation

Suggested grade level: 1, 2, 3

Materials needed: Balance scale, ball of clay weighing one kilogram, assorted junk objects

Procedure: Ask a classmate to help you. Place the ball of clay on one side of the balance scale. Choose some items from the junk box which you think will balance the ball of clay. Record what you have chosen in your notebook. Place the items on the other side of the balance scale. Did they balance? Was your guess greater than the ball of clay? Less than the ball of clay? Record your answer in your notebook. Now repeat this experiment at least four times using other items in the junk box.

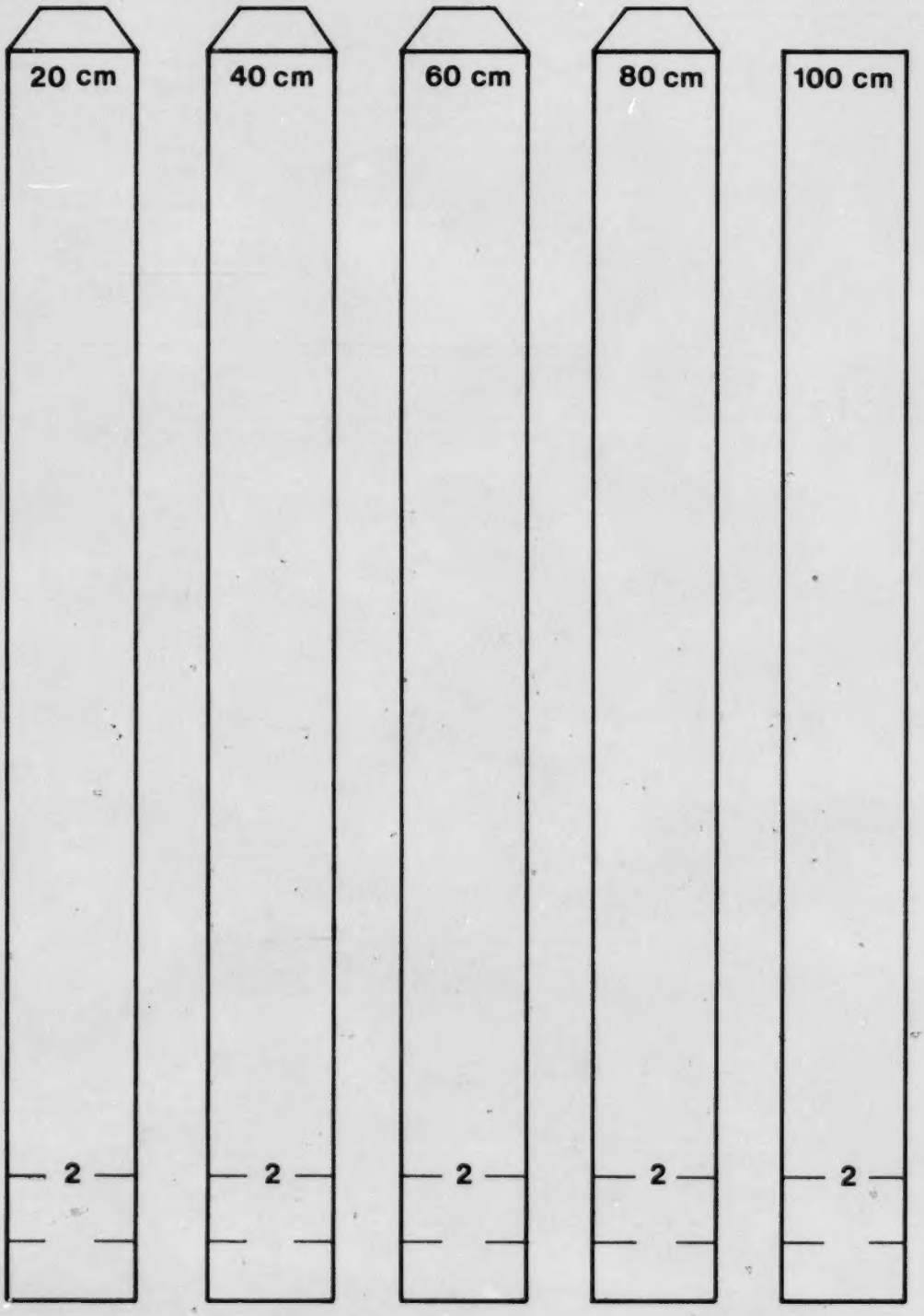
7-37 Make a Meter. Purpose: Linear measurement

Suggested grade level: 2, 3

Materials needed: Spiritmaster or equivalent with five strips each 20 cm long and 2 cm wide, scissors, glue, oaktag, strips of preceding dimensions

Procedure: Have children cut out the strips and glue them end to end to the oaktag. When completed, each child will have a meter measure.

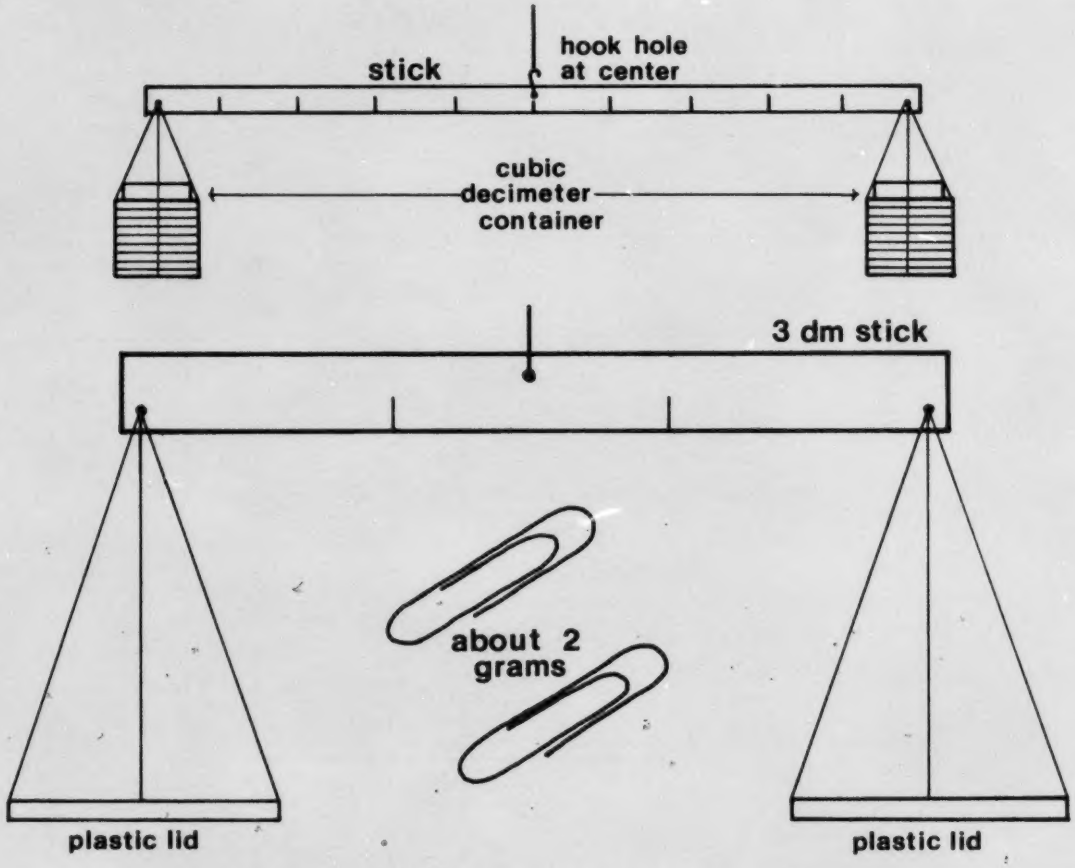
MEASUREMENT



7-38 Weigh It Down. Purpose: Construction of a balance scale using common materials, comparison of mass-weight of a variety of materials

Suggested grade level: 3

Materials needed: Meter stick, light scrap wood over one meter long. Cubic decimeter containers, cord



mass less than 1 gram	mass exactly 1 gram	mass more than 1 gram

Procedure: Construct a balance scale as illustrated. Make up your own chart and experiment with scrap materials.

7-39 One Shoe Off, One Shoe On. Purpose: Weighing, estimation, comparison, recording, directionality

Suggested grade level: 2, 3

Materials needed: Metric scale, junk box

Procedure: Take off your left shoe and hold it. Do you think it weighs more than one kilogram? Record your guess in your notebook. Place your shoe on the metric scale. How much does it weigh? Record your answer in your notebook. If your shoe weighs less than a kilogram, add items from the junk box until your shoe and the junk items weigh exactly one kilogram. What did you add to make one kilogram? Record these items in your notebook.

7-40 Simply Stuffed. Purpose: Estimation, comparison, weighing, recording

Suggested grade level: 1, 2

Materials needed: Metric scale, stuffed toys

Procedure: Ask a friend to work with you. Bring your favorite stuffed toy to school. Have your friend bring his favorite stuffed toy to school. Guess which stuffed toy weighs more. Draw a picture of it in your notebook. Weigh the toys. Draw a picture in your notebook of the toy that weighs more. Did you guess which toy weighed more?

7-41 A Weighty Volume. Purpose: Estimation, comparison, weighing, recording

Suggested grade level: 1, 2, 3

Materials needed: Balance scale, set of encyclopedias, one ball of clay weighing one kilogram

Procedure: Look at the encyclopedias. Hold them. Look at the ball of clay. Hold it. Guess which encyclopedia weighs the same as the ball of clay. Record your guess in your notebook. Now weigh the encyclopedia. Did you guess right?

7-42 Bag It. Purpose: Weighing, recording, estimation, conservation

Suggested grade level: 1, 2

Materials needed: Metric scale, popcorn in a plastic bag, cookies in a plastic bag

Procedure: Hold the popcorn. Hold the cookies. Guess which weighs more, the bag of popcorn or the bag of cookies. Record your guess in your notebook. Weigh the popcorn. Record your answer in your notebook. Weigh the cookies. Record your answer in your notebook. Which weighs more, the cookies or the popcorn?

7-43 Balance the Ball. Purpose: Weighing, estimating, comparing, recording

Suggested grade level: 3

Materials needed: Plasticene clay (large amount), balance scale, kilogram weight

Procedure: Place the kilogram weight on one side of the balance scale. Pick up the clay. Do you think you can make a ball of clay that will weigh the same as the kilogram weight? Guess whether you will need to add to the clay, or take away from the ball. Record your answer in your notebook. Make the ball of clay you think will balance the kilogram weight. Put it in the other side of the balance scale. Did it balance? Record your answer. Make the ball of clay either larger or smaller until you can balance the kilogram weight.

7-44 Pick a Paperback. Purpose: Weighing, recording, comparison, conservation

Suggested grade level: 2, 3

Materials needed: Metric scale, five paperback books of varying sizes and thickness

Procedure: Select the book you think weighs the most. Weigh it on the scale and record your answer in your notebook. Now, weigh the other books and record their weights in your notebook. Were you right? Did you pick the book that weighed the least? The most? Were you fooled by the books? What do you think fooled you?

7-45 Weigh Alikes. Purpose: Weighing, estimation, comparison, conservation

Suggested grade level: 1, 2, 3

Materials needed: Metric scale, two cans of different sizes, but identical in weight, labels removed, labeled can A and can B

Procedure: Pass the cans around the classroom. Be sure that each child handles the cans. Ask the children to guess which can weighs more, A or B. Have the children record their answers in their notebooks. Tell the children to weigh the cans. Ask them if they guessed correctly. Elicit reasons why, although cans are different in size, they are the same in weight.

7-46 Weight Watchers. Purpose: Estimation, comparison, weighing, recording, conservation

Suggested grade level: 1, 2

Materials needed: Assorted size containers of such materials as cardboard, aluminum, wood, metric scale

Procedure: Look at the containers. Guess which container weighs the most. Draw a picture of it in your notebook. Guess which container weighs the least. Draw a picture of it in your notebook. Weigh the containers. Which container weighed the most? Which container weighed the least? Did you guess right? What might make the containers weigh more? Less?

7-47 Buttons and Beans. Purpose: Weighing, comparison, estimation

Suggested grade level: 1, 2

Materials needed: Metric scale, bag of buttons, bag of beans

Procedure: Guess which weighs more, the bag of buttons or the bag of beans. Draw a picture of your guess in your notebook. Weigh the bag of buttons. Weigh the bag of beans. Which weighs more, the bag of buttons or the bag of beans? Draw a picture of your answer in your notebook.

7-48 Fresh Fruit. Purpose: Weighing, comparison, estimation

Suggested grade level: 1, 2

Materials needed: Metric scale, a banana, and an orange

Procedure: Hold the banana. Hold the orange. Guess which weighs more, the banana or the orange. Draw a picture of the one you guessed in your notebook. Now weigh the banana. Look at the scale carefully. Weigh the orange. Which weighed more, the banana or the orange? Draw a picture.

7-49 Look Alikes. Purpose: Weighing, recording, conservation, comparison

Suggested grade level: 1, 2, 3

Materials needed: Metric scale, two cans with labels removed of identical size and shape, but with different contents, i.e., cranberry sauce and clear chicken bouillon soup. Label cans A and B.

Procedure: Pass the cans around the classroom. Be sure that each child handles the cans. Ask the children to guess which can weighs more, A or B. Have the children record their answers in their notebooks. Tell the children to weigh the cans. Ask them if they guessed right. Elicit reasons why the cans vary in weight.

7-50 Lightweights. Purpose: Weighing, estimation, comparison, recording

Suggested grade level: 1, 2

Materials needed: Balance scale, assortment of lightweight items, such as peas, buttons, unifix cubes, etc., one ball of clay weighing exactly five grams

Procedure: Ask a classmate to work with you. Place a ball of clay on one side of the balance scale. Guess how many peas you will need to balance the ball of clay. Place the peas in the other side of the balance scale until it balances. Count the number of peas you needed. Record your answer in your notebook. Was your guess correct? Was it larger than the number of peas? Was it less than the number of peas? Try the same experiment using other materials.

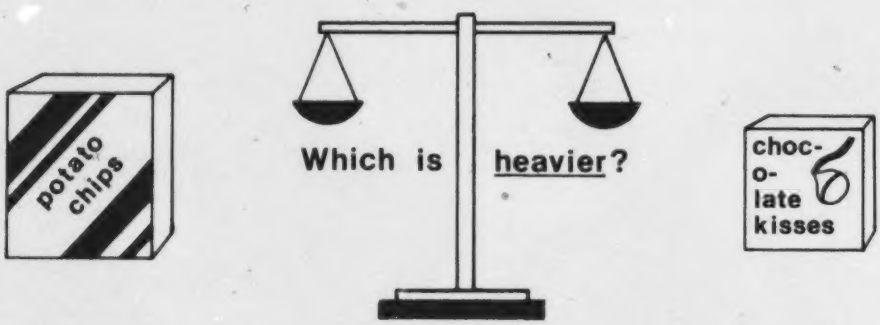
Which would weigh the *most*? the *least*?

7-51 Chips and Chocolate. Purpose: Estimation, comparison, weighing, recording, conservation

Suggested grade level: 1

Materials needed: One medium sized bag of potato chips, one smaller bag of chocolate kisses

Procedure: Hold the potato chip and the chocolate bag. Guess which bag weighs more. Draw a picture of the one you guessed in your notebook. Weigh the potato chips on the scale. Weigh the chocolate kisses, record your answer. Which weighed more? Draw a picture of the heavier bag in your notebook. Was this the bag you guessed was heavier?



7-52 Um, Um Good. Purpose: Estimation, comparison, conservation

Suggested grade level: 2, 3

Materials needed: Metric scale, candy bar, small package of cookies, small piece of fruit

Procedure: Look at each of the three objects and then hold each in your hand. Guess which one weighs the least. Draw a picture of it in your notebook. Weigh the object you think weighs the least. Record your answer in your notebook. Weigh the object you think weighs the most. Record your answer in your notebook. Did you guess right?

7-53 So Sweet. Purpose: Estimation, comparison, recording, weighing, subtraction

Suggested grade level: 3

Materials needed: Balance scale, 5 gram weight, bag of M & M's

Procedure: Place the 5 gram weight on one side of the balance scale. Hold the bag of M & M's. Guess how many M & M's you will need to balance the 5 gram weight on the scale. Record your guess in your notebook. Now, one at a time, add the M & M's to the other side of the balance scale. How many M & M's did you need to balance the 5 gram weight? Record your answer in your notebook. Was your guess greater than the number of M & M's you used? How much greater? Was your guess less than the amount of M & M's you used? How much less? Now ask your teacher if you may eat 5 grams of M & M's.

7-54 Please Don't Throw It. Purpose: Estimation, comparison, weighing recording

Suggested grade level: 3

Materials needed: Balance scale, brick, large stone

Procedure: Place a one kilogram weight on one side of the balance scale. Hold the brick in your hand. Guess which one is heavier, the brick or the kilogram weight. Record your guess in your notebook. Now place the brick on the other side of the balance scale. Which is heavier? Record the answer in your notebook. Did you guess right? Remove the brick. Hold the large stone in your hand. Guess which is heavier, the large stone or the kilogram weight. Record your guess in your notebook. Now place the large stone on the other side of the balance scale. Which is heavier? Record the answer in your notebook. Did you guess right?

7-55 Make a Gram. Purpose: Estimation, comparison, recording, weighing

Suggested grade level: 3

Materials needed: Metric scale, assorted lightweight items such as peas, beans, paper clips, buttons

Procedure: Fill in the chart below. How many make 10 grams?

Item	Guess	Amount Needed
Peas		
Beans		
Unifix Cubes		
Buttons		
Paper Clips		

You may add other items to the list, if you wish.

7-56 Please Don't Eat. Purpose: Estimation, comparison, recording, weighing, graphing

Suggested grade level: 1, 2

Materials needed: Metric scale, containers of the same size filled with sand, peas, and marbles

Procedure: Look at the container of sand. Hold it. Look at the container of peas. Hold it. Look at the container of marbles. Hold it. Guess which one weighs the most. Record your guess in your notebook. Guess which one weighs the least. Record your guess in your notebook. Weigh the container of sand. What does it weigh? Record your answer in your notebook. Weigh the container of peas. What does it weigh? Record your answer in your notebook. Weigh the container of marbles. What does it weigh? Record your answer in your notebook. Can you make a graph from what you have learned?

7-57 Pebble Possibilities. Purpose: Weighing, estimation, comparison, recording, subtraction

Suggested grade level: 3

Materials needed: Metric scale, bag of pebbles

Procedure: Pick up the bag of pebbles. Guess how many pebbles weigh one kilogram. Record your guess in your notebook. Now place some pebbles on the scale. Do they weigh one kilogram? If not, add more pebbles, or take away some pebbles. Count the number of pebbles you used to make exactly one kilogram. Record the answer in your notebook. Did you use more pebbles than you guessed? How many more? Did you need less pebbles than you guessed? How many less?

7-58 Little Things From a Big One. Purpose: Weighing, comparison, conservation

Suggested grade level: 1, 2, 3

Materials needed: One ball of clay weighing exactly one kilogram, one metric scale

Procedure: Weigh the ball of clay. Record the answer in your notebook. Cut the ball of clay into smaller pieces. Make different shapes out of the smaller pieces. You can make such things as a snake, a ball or an apple, to name just a few. Place all the smaller pieces of clay on the scale. What do they weigh? Why?

7-59 Which Weigh? Purpose: Weighing, comparison, estimating

Suggested grade level: 1, 2, 3

Materials needed: Metric scale

Procedure: Work with a friend. Guess who weighs more, you or your friend. Record your guess in your notebook. Weigh yourself to determine how many kilograms you weigh. Write the answer in your notebook. Who weighs more, you or your friend? Did you guess right?

7-60 Add a Clip. Purpose: Weighing, counting

Suggested grade level: 2, 3

Materials needed: Metric scale, one box of paper clips

Procedure: Place one paper clip on the scale. What does it weigh? Record the answer in your notebook. Add one more paper clip to the scale. What do the paper clips weigh now? Record the answer for two paper clips in your notebook. Repeat this experiment, adding one paper clip at a time and recording your answer, until you have ten paper clips on the scale. Why shouldn't you put the ten paper clips on the scale while they are in the box?

7-61 A Weighty Problem. Purpose: Estimation, comparison, recording, graphing, weighing, metric correspondence

Suggested grade level: 1, 2, 3

Materials needed: Metric scale, graph paper, unifix cubes or one inch cubes

Procedure: Children line up in order according to whom they estimate is the lightest to the heaviest. Each child stands on the metric scale and then records his weight in kilograms on a class chart. Use different unifix cubes to represent weights, i.e., one cube = one kilo. Copy the graph on paper from the unifix cubes. Make comparisons of the estimates and actual weights in kilograms.

7-62 Old King Kilo. Purpose: Mass tandardized measurement, comparison, counting, recording, equalities, and inequalities

Suggested grade level: 1, 2, 3

Materials needed: Metric scale, a book, a shoe, a box of paper clips, a box of pencils, a box of crayons

Procedure: Weigh your shoe on the metric scale. Does it weigh more than 200 grams? Does it weigh less than 200 grams. Record the weight in your notebook. Now weigh the book. Does the book weigh more or less than your shoe? Do the same thing with a box of paper clips, a box of pencils, and a box of crayons. Which weighs more than your shoe? Which weighs less than your shoe? Record your answers.

7-63 Grams Are Grand. Purpose: Estimation, counting, weighing with metrics

Suggested grade level: 1, 2, 3

Materials needed: Balance scale, clay, coins, wooden beads, pine cones, other common objects

Procedure: Use two coins to equal 10 grams. Put them on the balance scale. How many different things can you find on the weighing table to equal 10 grams? Count them. Guess how many wooden beads equal 10 grams. Weigh them. Count them. Guess how many pine cones equal 10 grams. Weigh them. Count them. Did you guess more or less of each? Record your answers in your notebook. Children not ready to write could record their answers using pictorial representations.

7-64 Sand, Sugar, and Flour. Purpose: Estimation, comparison, recording, weighing

Suggested grade level: 3

Materials needed: Balance scale, teaspoon, box of sand, box of sugar, box of flour

Procedure: Place the five gram weight on one side of the balance scale. Guess how many teaspoons of sand you will need to balance the five gram weight. Record your guess in your notebook. Guess how many teaspoons of sugar you will need to balance the five gram weight. Record your guess in your notebook. Guess how many teaspoons of flour you will need to balance the five gram weight. Record your guess in your notebook. Use the teaspoon to measure the sand into the other side of the balance scale. How many teaspoonsful did you use? Record your answer in your notebook. Use the teaspoon to measure the sugar into the other side of the balance scale. How many teaspoonsful did you use? Record your answer in your notebook. Use the teaspoon to measure the flour into the other side of the balance scale. How many teaspoonsful of flour did you use? Record your answer in your notebook. Compare your answers to your guesses. Was your guess for sand greater or less than the amount you used? Was your guess for the sugar greater or less than the amount you used? Was your guess for the flour greater or less than the amount you used?

7-65 Can Quarts Measure Up? Purpose: Liquid measurement, estimation, comparison, recording

Suggested grade level: 3

Materials needed: One liter container, one quart container

Procedure: Fill the liter container with water. Empty it. Fill the quart container with water. Empty it. Guess whether the quart container will fill the liter container. Record your answer in your notebook. Carefully fill the quart container with water, and empty it into the liter container. Did the quart container fill the liter container? Record your answer in your notebook. Did you guess right?

7-66 Let's Find Out. Purpose: Metric awareness, comparing a standard measure

Suggested grade level: 1

Materials needed: A graduated set of metric containers

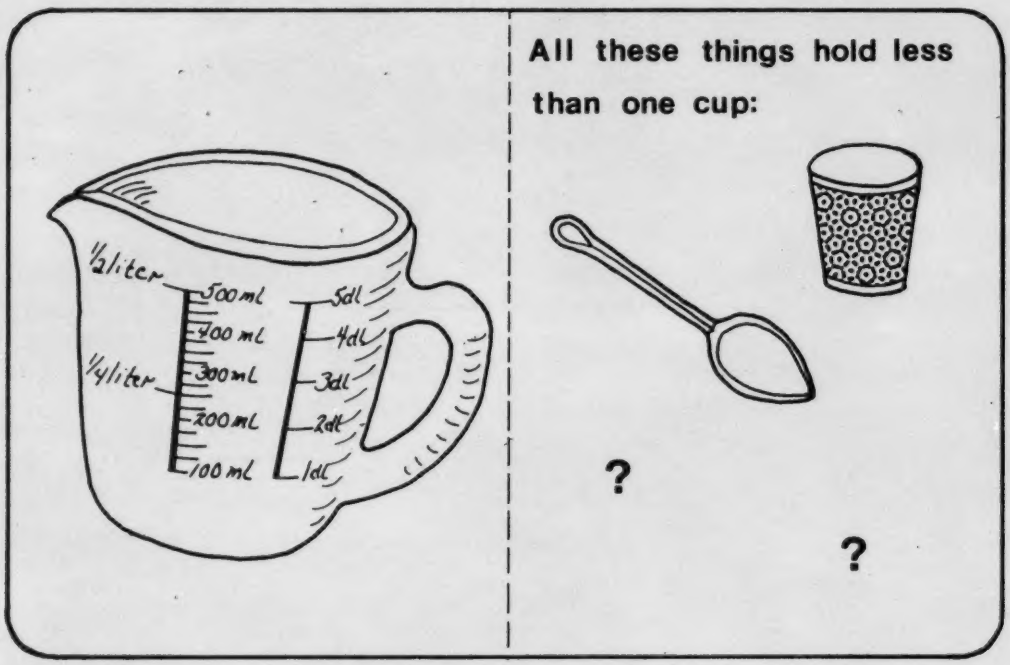
Procedure: How many metric containers do you have at the water table in the classroom? Draw them. Find out which holds the most water. Draw it.

7-67 A Cup or Less. Purpose: Metric awareness, comparing

Suggested grade level: 1

Materials needed: Graduated set of metric containers, a measuring cup

Procedure: How many metric containers do you have in the classroom that hold less than a cup? Draw them and make a chart.



7-68 Saucy Susan. Purpose: Metric awareness, standard measuring, comparing

Suggested grade level: 1

Materials needed: Saucepan, graduated set of metric containers

Procedure: How many metric containers can you find that hold more than a saucepan? Draw them and make a chart.

7-69 A Liter Guess. Purpose: Metric awareness, comparing, standard measurement

Suggested grade level: 1, 2

Materials needed: Cream carton, teapot, egg cup, 1 liter measure, 1/2 liter measure, 1 tablespoon labeled 15 ml

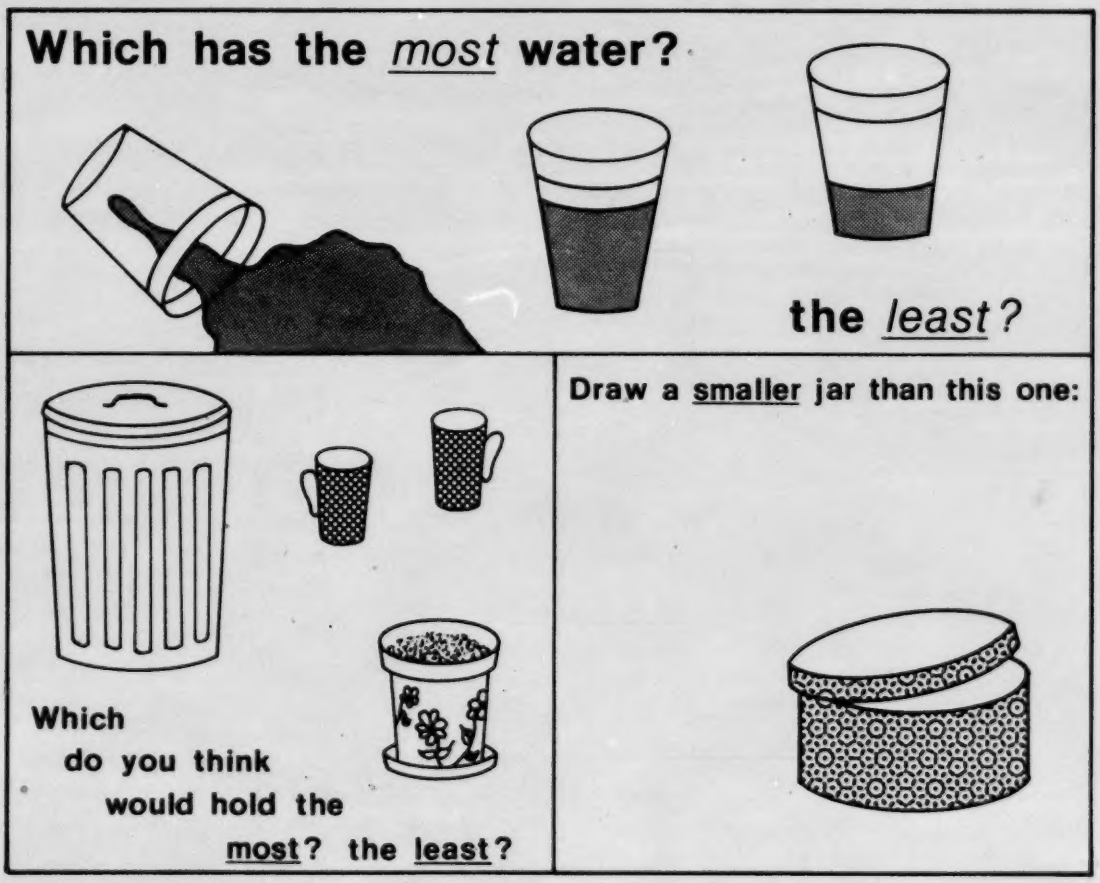
Procedure: Which of these do you think holds more? A cream carton or 1/2 liter measure? A teapot or 1 liter measure? An egg cup or 1 tablespoon? Draw a picture of the one you guessed in your notebook. How can you find out if you were right?

7-70 Introduction to Volume and Capacity. Purpose: Metric vocabulary, comparing, nonstandard measuring

Suggested grade level: 1

Materials needed: Set of containers, water, food coloring

Procedure: Color water with food coloring and pour into see thru containers. Allow for observation, comparing, and pictorial representation.



7-71 Find Out. Purpose: Metric vocabulary, graphing, nonstandard measuring, counting

Suggested grade level: 1, 2

Materials needed: Paper, pencil, crayons

Procedure: What containers do you know that we might call a liter? What containers can you think of that might be called a 1/2 liter measure? More than a liter? Draw them in your notebook. Have students make a picture graph.

7-72 From Monday to Monday. Purpose: Temperature, recording, comparison, telling time

Suggested grade level: 1, 2, 3

Materials needed: Indoor Celsius thermometer, tape

Procedure: Tape the thermometer in a corner of your classroom. Each Monday morning, at 9:30, read the thermometer and record your answer in your notebook. Do this for five Mondays in a row. Has the temperature gone up each Monday? Has the temperature gone down each Monday? Has it stayed the same? Can you figure out why this happened?

7-73 Boxes Bigger and Better. Purpose: Metric vocabulary, metric measurement, nonstandard measurement, comparing, estimating

Suggested grade level: 2, 3

Materials needed: Collection of boxes, sand

Procedure: Collect different shaped boxes. Fill one box with sand. Pour sand into another box. Which holds more? How can you tell? Arrange the boxes in size order, smallest first. Did you know you have been measuring the capacity of the containers? The measured amount is what we call volume.

7-74 Measure and Weigh. Purpose: Metric measurement, standard measuring, estimation, comparison, recording

Suggested grade level: 3

Materials needed: Metric scale, liter measure

Procedure: Fill one liter measure with water. Guess how much it weighs. Record your answer. Ask a friend to do the same. Compare your measurements. Did you both guess the same? More? Less? With the help of your friend, weigh one liter of water. What did you discover? How does your discovery compare with your estimate? Did you find out anything about the metric system of weight and the metric system of capacity? Write a sentence to explain. Now weigh one-half liter of water and one-fourth liter of water. What have you found out?

7-75 Keeping Track. Purpose: Metric measurement, standard measurement, estimating, comparing, recording

Suggested grade level: 2, 3

Materials needed: Bucket, teapot, bowl, pitcher, large milk container, saucepan, a liter measure, and a 1/4 liter measure

Procedure: Collect above items. Use liter and 1/2 liter measure to find the capacity of each. Estimate the capacity before you measure. Try using this chart.

	Guess liter	Measure liter	Mistake liter
1) bucket			
2) teakettle			
3) bowl			
4) pitcher			
5) milk container			
6) saucepan			
7) large glass			
8) juice container			
9) large jar			

7-76 One a Day. Purpose: Metric measuring, counting, addition

Suggested grade level: 3

Materials needed: Medicine bottle, tablespoon

Procedure: Fill a medicine bottle with water. Can you find out about how long it will last you if you take one tablespoon every day? How many ml will you take altogether if one tablespoon equals 15 ml?

7-77 Fix Six. Purpose: Metric measuring, counting, comparing

Suggested grade level: 1, 2

Materials needed: 1/2 liter measure, a variety of containers

Procedure: Can you find six things at the water table that hold less than 1/2 liter measure? Draw them. Can you find six things at the water table that hold more than 1/2 liter measures? Draw them.

7-78 Think Metric With Milk. Purpose: Metric awareness, counting, standard measuring, estimation, recording, comparing

Suggested grade level: 1, 2, 3

Materials needed: School milk container, a crate

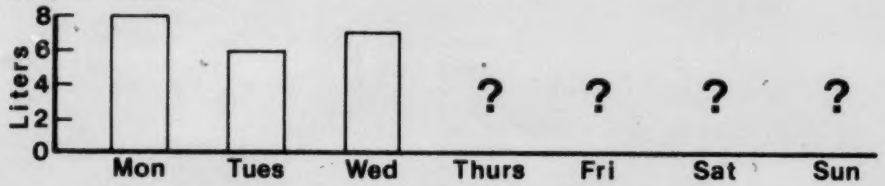
Procedure: When you drink milk in school, how much do you drink? A liter? 1/2 liter? 1/4 liter?

7-79 Milky Way. Purpose: Counting, comparing, graphing

Suggested grade level: 2, 3

Materials needed: Graph paper

Procedure: Can you make a graph that would show how much milk your class drinks in school for one week? Do they drink the same amount every day? What did you find out?



7-80 Be a Liter Bug. Purpose: Metric measuring, estimation, counting, recording, comparison, tallying

Suggested grade level: 1, 2, 3

Materials needed: Pail or large basin, 1/2 liter measure

Procedure: Fill the 1/2 liter measure with water. Empty the 1/2 liter measure into the large container. About how many 1/2 liters do you think will fill the container? Guess. Record it. Now fill the large container with the 1/2 liter measure and count how many 1/2 liters it takes. Record it. Make tally marks as you count.

7-81 Liter Line Up. Purpose: Estimation, counting, comparing, recording, volume, metric measuring

Suggested grade level: 1, 2

Materials needed: Liter measure, assortment of large containers such as pail, teakettle, saucepan, basin

Procedure: Arrange containers according to size (estimate). Use the liter measure to fill the large containers. Guess which holds the most. Write your estimate in your notebook. Use the liter measure to fill each container. How many liters does each container hold? Was your estimate correct?

7-82 Metric Medicine. Purpose: Metric measuring, comparison, estimation, counting, recording, equalities, inequalities

Suggested grade level: 1, 2, 3

Materials needed: 1/2 liter measure, medicine bottle

Procedure: Guess how many medicine bottles fill a 1/2 liter measure. Write your guess in your notebook. Fill the medicine bottle with water and find out how many medicine bottles make a 1/2 liter measure. Were you right? Compare your guess to your measure. Did you guess more? or less? or the same?

7-83 Humpty Dumpty Metrics. Purpose: Metric measurements, estimation, counting, recording, comparison

Suggested grade level: 1, 2

Materials needed: 1/2 liter measure, egg cup

Procedure: Guess how many cups fill a 1/2 liter measure. Record your answer. Count how many egg cups fill a 1/2 liter measure. Record your answer. Compare your guess to your measurement. Did you guess more? Less? Or the same?

7-84 Bottles Big and Small. Purpose: Metric measuring, comparing, estimation, recording, counting

Suggested grade level: 2, 3

Materials needed: Collection of different size bottles, liter measure

Procedure: Select bottles that you think hold one liter from a bottles collection. Use the liter measure and find out if you chose the right ones. What did you find out? Record your answer. How many did you choose that were exactly one liter? More than one liter? Can you draw them?

7-85 Mini Metric. Purpose: Capacity, standard, nonstandard, comparison, counting, equalities, inequalities, recording, sequence

Suggested grade level: 2, 3

Materials needed: Graduated set of medicine bottles and a standard teaspoon (5 ml)

Procedure: Arrange medicine bottles in size order. Guess how many teaspoons fill the smallest bottle? Then, the next and the next going in size order. Record your findings each time. Now measure each one counting by 5's (5 ml = 1 tsp.) Compare your answer to your guess. Did you guess more? Less? Or the same?

7-86 What's In The Pan? Purpose: Liquid measurement, estimation, comparison, recording

Suggested grade level: 1, 2

Materials needed: Paper cup, saucepan

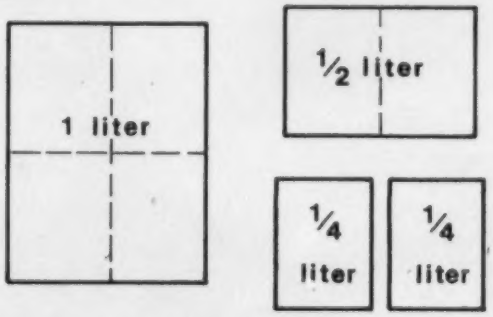
Procedure: Guess how many paper cups full of water it takes to fill the saucepan. Record your guess in your notebook. Carefully fill the paper cup and empty it into the saucepan. Do this until the saucepan is full. How many times did you fill the paper cup? Record your answer in your notebook. Was your answer greater than your guess? How much greater? Was your answer less than your guess? How much less? Did you guess right?

7-87 Merry Metric Millie. Purpose: Volume, mass, standard measuring, estimation, comparison, counting, recording

Suggested grade level: 3

Materials needed: 1 liter measure, a set of graduated metric containers (ml)

Procedure: Fill the largest container. Pour it into the liter measure. How many times must you do this to measure one liter? Repeat this experiment with the other containers. What did you discover? Record your findings. If you have a metric scale weigh the water in each container. What did you discover this time? Were you surprised or did you guess correctly?



7-88 Milli Guess. Purpose: Metric measurement, comparison, estimation, counting

Suggested grade level: 2, 3

Materials needed: Teaspoon, a cup, a cream carton

Procedure: Explain that one standard teaspoon equals 5 milliliters. Fill the cup with the teaspoon. How many teaspoons of water filled the cup to the brim? Record your answer. Guess how many teaspoons of water would fill a cream carton. Record your guess. Now fill the cream carton using the teaspoon. What did you discover? Which held more, the cup or the cream carton?

7-89 Put It In The Pot. Purpose: Comparison, estimation, liquid measure, recording, counting, subtraction

Suggested grade level: 1, 2

Materials needed: Liter container, large saucepan

Procedure: Fill the liter container with water. Empty it. Fill the saucepan with water. Empty it. Guess how many times you will have to fill the saucepan with water and empty it into the liter container. Record your guess in your notebook. Carefully fill the saucepan with water and empty it into the liter container. Do this until you have filled the liter container. How many times did you fill the saucepan? Record your answer in your notebook. Was your guess greater than your answer? How much greater? Was your guess less than your answer? How much less? Was your guess exactly right?

7-90 It Doesn't Fizz. Purpose: Liquid measurement, estimation, comparison, recording

Suggested grade level: 2, 3

Materials needed: One empty soda can, one half liter measure

Procedure: Fill the half-liter measure with water. Hold it. Empty it. Fill the soda can with water. Hold it. Empty it. Guess how many times you will have to fill the soda can with water and empty it into the one half liter container in order to fill the container. Record your guess in your notebook. Now, fill the can with water, and keep emptying it into the one half liter container until it is filled. How many times did you have to fill the can? Record your answer in your notebook. Was your guess greater than the number of times you filled it? Was your guess less than the number of times you filled it?

7-91 My Pal, the Principal. Purpose: Temperature, recording, comparison, telling time

Suggested grade level: 1, 2, 3

Materials needed: Two indoor Celsius thermometers, tape

Procedure: Work with a friend. Ask if you may tape one thermometer on the windowsill in the principal's office. Tape the other thermometer to the windowsill in your classroom. Each morning, for one week, at exactly 9:30 a.m. ask your friend to read and record the temperature in your classroom. Each morning at exactly 9:30 a.m., read and record the temperature in the principal's office. What did you notice about the temperature readings in your room and in the principal's office? Compare them. What do you think causes this?

7-92 Counting Cups. Purpose: Comparison, estimation, liquid measurement, recording, counting, subtraction

Suggested grade level: 2, 3

Materials needed: One paper cup, one-quarter liter container

Procedure: Fill the paper cup with water. Empty it. Fill the one-quarter liter container with water. Empty it. Guess how many times you will need to fill the paper cup with water to fill the one-quarter liter container. Record your guess in your notebook. Carefully, fill the paper cup with water, and empty it into the one-quarter liter container. Count the number of times you have to fill the paper cup. Record your answer in your notebook. Was your guess greater than the answer? How much greater? Was your guess less than the answer? How much less? Did you guess correctly?

7-93 Fresh From Florida. Purpose: Liquid measurement, estimation, comparison, recording, subtraction

Suggested grade level: 1, 2, 3

Materials needed: Half-liter container, one frozen orange juice concentrate container

Procedure: Fill the orange juice container with water. Empty it. Fill the half-liter container with water. Empty it. Guess how many times you will have to fill the orange juice can with water to fill the half-liter container. Record your guess in your notebook. Carefully, fill the orange juice container with water and empty it into the half-liter container. How many times did you fill the orange juice can? Record your answer in your notebook. Was your guess greater than the answer? How much greater? Was your guess less than the answer? How much less? Was your guess the same as the answer? Very good guessing!

7-94 Helpful Hints - Cold. Purpose: Temperature, standardized measuring, recording, comparison

Suggested grade level: 3

Materials needed: Large Celsius model or teacher made diagram

Procedure: Look on the diagram to find out what the temperature on a very cold day in winter would be. What do you think the temperature of ice-cream would be? How about a glass of water without ice? Write your answer in your notebook. Now compare your answers to those of a friend. What did you find out? Did you both have the same ideas or were they different? Talk about your answers with your teacher.

7-95 Helpful Hints - Hot! Purpose: Celsius temperature, comparison, recording

Suggested grade level: 3

Materials needed: Thermometer (large model) or teacher made diagram

Procedure: Find out by looking at the hints on the diagram what the temperature would be on a hot day in summer. The temperature of a hot bowl of soup. A warm bath. The coil of the hot plate in your classroom. A sick person with fever. Record your answers. Compare your answers to those of a friend.

7-96 Temperature. Purpose: Temperature, comparison, recording, graphing nonstandard measuring

Suggested grade level: 1, 2, 3

Materials needed: Three similar containers, hot water, warm water, and ice water

Procedure: Fill the middle container with warm water, the container on one side with water not hot enough to burn and the container on the other side with ice water. Hold your hand in the hot water for as long as you can (about a minute is sufficient). Then quickly put it into warm water. How does it feel? Write how it feels on a class chart. Have some of your classmates do the same thing. Compare your answers. Are they the same? Make a graph of what you found out. Do the same experiment with ice water and warm water. Did it feel the same to everyone? Do people make good thermometers or do we need a better standard?

7-97 Make A Bottle Thermometer. Purpose: Temperature, nonstandard measuring, comparison, metric measuring, recording

Suggested grade level: 3

Materials needed: A narrow necked bottle, food coloring, water, and a pan

Procedure: Make colored water with food coloring. Fill the bottle until the colored water is half way up the narrow neck. Set the bottle into a pan of hot water. After about 20 minutes mark the level of water in the neck with a tiny sliver of masking tape. Take the bottle out of the pan and let it stand for a while. Put warm water in the pan and repeat the experiment. Later do the same with cold water in the pan. Be sure to mark the water level in the neck with tape. Record your findings. What did you discover? How many millimeters did the tape change? Find a narrower bottle and try another experiment. What did you find out with a narrower bottle? Record your findings.

7-98 Boiling Point. Purpose: Temperature, comparison, standard measuring, recording

Suggested grade level: 3

Materials needed: Pyrex pot filled with boiling water, high temperature celsius thermometer, homemade cardboard and ribbon thermometer

Procedure: Ask your teacher to bring the water to a boil in a Pyrex pot. Use the high temperature thermometer. Test the water and observe the boiling point. Use the thermometer you have made and indicate where the boiling point is by moving the ribbons.

7-99 Construct a Model Thermometer. Purpose: Celsius temperature, metric linear measuring, counting by tens, directionality, spatial relationships, writing numerals

Suggested grade level: 1, 2, 3

Materials needed: Oak tag, metric ruler, ribbon or plastic

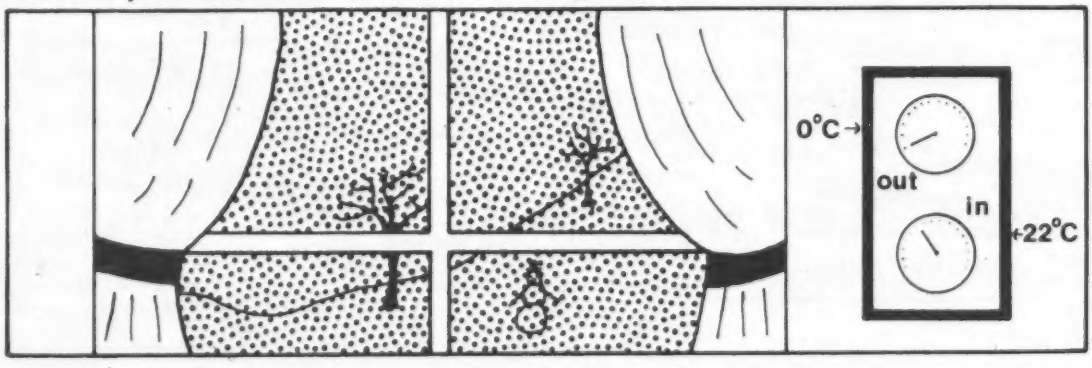
Procedure: Use metric ruler and draw two parallel lines on oak tag, 14 cm long with 2 cm between the two lines. Put ruler on one line and mark a dot for each cm. Count three dots from the bottom and label 0, then next dot 10, counting by 10's until 100 is reached, thus labeling each dot 10 more. Use 1 cm wide ribbon (white) 20 cm long plus allow for 1-2 cm overlap. Make 10 cm red. Insert ribbon below 0 and above 100 and fasten in back with stapler. Be careful not to staped onto oak tag allowing ribbon to slide back to front and vise-versa. Now the thermometer is ready to be used.

7-100 Weekly Weather. Purpose: Temperature, standard measuring, recording, comparing, graphing

Suggested grade level: 1, 2, 3

Materials needed: Two Celsius thermometers

Procedure: Place one thermometer outside and one inside. Record the indoor and outdoor temperatures in Celsius degrees for one week. Make a graph or chart for each. What did you discover? Perhaps you could invite another class in your school to do the same thing and then compare your records.



TEMPERATURE